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IN RE THE APPLICATION OF

Examiner:

Group Art Unit:

FOR: PERSONALISED FINANCIAL  
PRODUCTS AND COMPUTER  
IMPLEMENTED MANAGEMENT  
SYSTEM

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

Under the International Convention, for the purposes of priority, applicant claims the benefit of Great Britain Application No. 0030707.4, filed December 15, 2000.

DATE: April 27, 2001

Respectfully submitted,

**Peter J. Shakula**  
**Registration No. 40,808**  
**LEE, MANN, SMITH, MCWILLIAMS**  
**SWEENEY & OHLSON**  
**P.O. Box 2786**  
**Chicago, Illinois 60690-2786**  
**(312) 368-1300**  
**Fax: (312) 368-0034**

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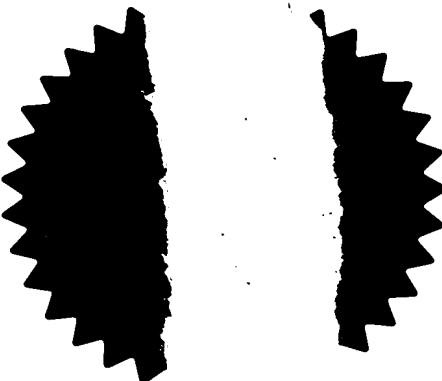


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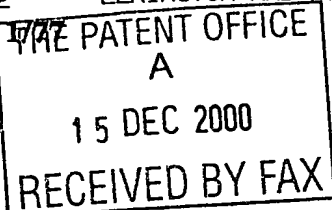
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## Request for grant of a patent

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The Patent Office

Cardiff Road  
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1. Your reference

JME/P15944GB

2. Patent application number

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18DEC00 E592005-1 D00032

01/7700 0.00-0030707.4

0030707.4

3. Full name, address and postcode of the or of each applicant (underline all surnames)

FortuneBright Limited  
200 Aldersgate  
London  
EC1A 4JJ

Patents ADP number (if you know it)

8045072001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

Personalised Financial Products and  
Computer Implemented Management  
System.

5. Name of your agent (if you have one)

ELKINGTON AND FIFE

"Address for service" in the United Kingdom  
to which all correspondence should be sent  
(including the postcode)

ELKINGTON AND FIFE  
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8 PEMBROKE ROAD  
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Patents ADP number (if you know it)

67004

6. If you are declaring priority from one or more  
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Date of Filing  
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7. If this application is divided or otherwise  
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Number of earlier application

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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer "Yes" if:
- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
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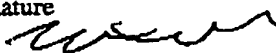
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Statement of inventorship and right to grant of a patent (Patents Form 7/77)	0
Request for preliminary examination and search (Patents Form 9/77)	0
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11.

I/We request the grant of a patent on the basis of this application.

Signature



Date

14 December 2000

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr Jonathan Exell  
01732 458881

## **Personalised Financial Products and Computer Implemented Management System**

### **Field of the invention**

- 5           The present invention relates to personalisable financial products and an associated computer implemented management system, both of which are particularly applicable to the credit card service industry.

### **Background to the invention**

- 10           Many variations on common financial products such as credit cards, insurance policies, loans, mortgages, current accounts and the like are now available to the consumer. Each financial product attempts to offer its own unique selling point (USP) that differentiates it from the others in the same market. For example, one mortgage provider may offer a mortgage product at an interest rate discounted below  
15           the base interest rate whilst another may offer a similar mortgage product at a higher interest rate but with other incentives such as cash-back.

- In each case the purchaser is faced with deciding which product is most suitable for his or her needs and this may take a large amount of research given the proliferation of financial products and financial product providers. Particularly where  
20           the purchaser is tied to the product or would encounter great difficulty transferring to another financial product provider, many purchasers expend great care and attention to ensure their choice is the most suitable product.

- The large number of financial products and variations on the market also affects the financial product provider. Each product variation is usually targeted at a  
25           particular audience and is tailored to characteristics of that audience to provide, with a reasonable level of certainty, a level of profitability per customer. Accepting customers with different characteristics is likely to reduce or vary that level of profitability. A provider must therefore offer a range of products with different variations tailored to different audience characteristics in order to target more than  
30           one specific audience whilst being profitable. The overheads of marketing, management and administration obviously increase as a provider increases the number of products and product variations available but, at present, this is the only way to target a number of audiences whilst ensuring a level of profitability.

Following the uptake of the Internet by both business and home users, financial product providers are slowly making their product application procedures and product management facilities available over the Internet to end users. However, as the success of a product application is subject to one or more successful credit and/or background checks, many current application procedures still entail a waiting period in which offline checks are performed before the user is informed of success or failure of his or her application.

More recently, personalised financial products are becoming available. In such products, the benefits and costs are tailored to suit the potential profitability of a purchaser and his or her financial situation. A common example is a financial loan in which the interest rate offered is dependent on the financial and personal situation of the purchaser. In such products, a large amount of data is processed using statistical analysis and probabilistic functions to determine the value of the purchaser to the provider. This information, in combination with credit and background check results, is used to determine the benefits of the financial product offered, if the product is offered at all.

Due to the large amount of processing required to perform the statistical analysis and probabilistic evaluation, the majority of providers perform the processing offline and do not offer the products over the Internet. Even in the case of the few providers that do have products offered online, the level of personalisation offered for the products is typically extremely limited and cannot be altered by the purchaser.

#### **Statement of invention**

According to one aspect of the present invention, there is provided a method of offering a personalised financial product comprising the steps of:

- (a) obtaining details from a user;
- (b) determining profitability characteristics of the user in dependence on the obtained details;
- (c) offering a financial product to the user, the financial product having a plurality of inter-related cost-benefit parameters changeable by the user, the inter-relationship of the parameters being determined in dependence on the profitability characteristics of the user, wherein the parameter settings are changeable by the user, a change to one parameter setting having a corresponding effect on one or more of the other parameter settings determined by the inter-relationship;



- (d) receiving acceptance of the financial product from the user, the acceptance including the parameter settings; and,
- (e) creating a financial product for the user, the product having characteristics determined in dependence on the parameter settings.

5

In this manner, pricing for the financial product is achieved in a real-time manner and the financial product characteristics can be instantly updated by the user who will immediately see the effects of those updates as the financial product.

10 Preferably, the method further comprises the steps of:

- (f) accepting updated parameter settings from the user after creation of the financial product; and,
- (g) updating the financial product for the user in dependence on the updated parameter settings.

15

The user details obtained in step (a) may include selected ones of: employment data, financial data, personal data, home address, and family data.

20

The profitability characteristics determined in step (b) may include selected ones of: credit check for the user's name, fraud check for the user's home address, background check on the user, projected likelihood of the user defrauding or defaulting a payment against the provider, projected likelihood of the user transferring an existing balance, projected monthly amount the user will spend, the projected likelihood the user's account will go dormant, projected likelihood the user will move to another provider.

25

The financial product may be a selected one of: credit card, loan, mortgage, investment product or insurance product.

30

The inter-relationship of parameters may be selected from one of a set of inter-relationship parameters, each set being pre-calculated for users fitting a predetermined range of details.

The inter-relationship of parameters may be updated for an existing user based on actual data from the user's usage of the financial product.

According to another aspect of the present invention, in a computer implemented transaction system for the offer and management of financial products, there is provided a server arranged to offer customisable financial products to users, to  
5 determine profitability characteristics of the user in dependence on obtained user details and generate a user interface having a plurality of inter-related cost-benefit parameters changeable by the user, the inter-relationship of the parameters being determined in dependence on the profitability characteristics of the user, wherein the parameter settings are changeable by the user, a change to one parameter setting  
10 having a corresponding effect on one or more of the other parameter settings determined by the inter-relationship, the server being arranged to receive an acceptance of the financial product from the user, and initiate the creation of a financial product for the user, the product having characteristics determined in dependence on the parameter settings.

15

Preferably, the transaction system comprises a World Wide Web site, the server being arranged to host the Web site.

The server may be connected to a database of parameter permutations, the server  
20 being arranged to access the database and determine allowable parameter permutations according to the user's details, the allowable parameter permutations being used to generate the user interface.

The database may store parameter permutations as coefficients to a predetermined  
25 equation, the equation defining the inter-relationship between parameters.

The database may store parameter permutations for each of a predetermined set of user details, the server being configured to select the closest predetermined set corresponding to the user's details.

30

The system may include a user interface system downloadable onto a user terminal, the user interface system being operative to accept parameter permutations from the server, to generate and display the user interface in dependence on the parameter

permutations, to accept user inputs changing the parameter settings and to communicate the selected parameter settings to the server.

By offering a user interface system that is downloaded to a user's terminal and  
5 incorporates the engine necessary to determine the effect of changes to parameters,  
client-server communication is reduced hence speeding up calculations. Furthermore,  
by storing and using only coefficients to a predetermined equation to define the  
interrelationships, the coefficients being transmitted to drive the engine, no complex  
or confidential data is transmitted to the client, thus speeding up communications and  
10 limiting data theft.

The server may be arranged to communicate with databases and data services to  
obtain data for calculating the profitability characteristics of the user, the databases  
and data services including: credit clearance, background checks, demographic data,  
15 business logic, household background databases and probability based systems.

#### **Brief description of the drawings**

An example of the present invention will now be described in detail with  
reference to the accompanying drawings in which:

20 Figure 1 is a screen shot of a user interface of a computer implemented  
management system according to an example of the present invention; and,

Figure 2 is a schematic diagram of a network incorporating a computer  
implemented management system according to an example of the present invention.

#### **25 Detailed description**

Figure 1 is a screen shot of a user interface of a computer implemented  
management system for a financial product according to an example of the present  
invention. In the following example, the financial product is a credit card. However,  
it will be appreciated that the computer implemented management system and  
30 underlying method are equally applicable to other financial products and their  
management such as loans, mortgages, insurance policies, investments, bank accounts  
and the like.

A user visits a World Wide Web site of a financial product provider and  
selects to apply for a credit card. Having entered his personal and financial details, he

is presented with a user interface 10. The user interface 10 includes a number of controls 20-70. Each control corresponds to a user configurable variable relating to the credit card. Controls 20-50 are slider bars allowing the user to set a desired APR (Annual Percentage Rate) 20, cash-back percentage 30, APR applied to transferred balances 40, and annual fee 50. The control settings are interdependent. For example, by changing the settings of the cash-back control 30 the APR control position is changed, thus representing a change in the APR variable. This enables the provider to maintain a desired expected profitability as is explained further below. The remaining controls 60, 70 respectively allow the setting of payment method (Direct Debit, monthly repayment, etc.) and statement frequency by means of drop down menus.

Each control setting may be limited by the personal and financial details of the user and settings of the other controls. It will be appreciated that control settings will generally either have a cost to the user and a benefit to the provider or vice-versa. For example, a high APR is detrimental to the user but beneficial to the provider. Equally, a high cash-back percentage is detrimental to the provider but beneficial to the user. By means of the interdependencies between variable settings the user is able to adjust the characteristics of the credit card to suit his or her preferences without changing his or her profitability to the provider.

Once the user is satisfied with the control settings, he or she can accept them by clicking an accept button 80. This has the effect of triggering the issue of a new credit card for the user by the provider and creating a new account for the credit card that has characteristics corresponding to the variable settings in the controls.

A user that clears his balance every month may desire a credit card with a high cash-back percentage and low annual fee. As he clears his balance he would not care about APR rates and can thus set the controls accordingly. The beneficial effects of high cash-back and low annual fees are balanced by high APRs. Alternatively, a user that carries over balances from one month to another would wish to have a low APR. In order to obtain such an APR he or she must sacrifice some or all of the benefits of cash-back and may also have to pay or increase an annual fee.

The user interface 10 is also accessible to existing credit card customers of the provider. Upon entering details of his or her account, the user is presented with the user interface 10 and is able to update the control settings. The user can accept the updated control settings by clicking the accept button 80. The accepted control

settings are applied to the user's account so that the characteristics of the credit card account are changed.

For management and accounting purposes, the provider may limit the number of times the user can access and update the controls for a credit card in any given  
5 period.

It may be that for implementation purposes certain controls are linked together to create the interdependencies. For example, the APR control 20 may be linked to the cash-back control 30 such that increasing the APR control value increases the cash-back control value and vice-versa. Obviously this limits the flexibility of the  
10 product and it is therefore desirable that the interdependency be at as high a level as possible. For a credit card it may be that all other variables are dependent on the APR value.

Another configuration would be to define a pool of points or similar in dependence on the user's financial and personal details. Changing controls so that the  
15 user benefits has the effect of deducting a predetermined number of points from the pool in dependence on the change whilst a change that detracts the user (or benefits the provider, such as increasing the period in which statements are provided or eliminating statements altogether) has the effect of increasing the number of points in the pool. Thus, a user would have complete control over the settings of the controls  
20 and would only be limited by the number of points available.

Figure 2 is a schematic diagram of a network incorporating a computer implemented management system according to an example of the present invention.

A server 100 hosts a World Wide Web site on 120 on the Internet 130. The Web site 120 includes a user details page 140, a page 150 corresponding to the user  
25 interface previously described with reference to Figure 1 and a logon page 160.

A user is able to access the Web site 120 via a Web browser on an Internet terminal 170. Upon accessing the Web site, the user is requested to logon or apply for a credit card account. A new user, selecting to apply for a new account is presented with the user details page 140 in which he or she must input his or her personal and  
30 financial details. Once the user has input the details and selects to submit them, the details are passed to the server 100. The server 100 processes the details and obtains a credit and background check for the user from a database 180. The database 180 may include data by household location, surname, business based logic, credit listings and other sources. From the results of the credit check and the personal and financial

details of the user, the server 100 determines the user's net present value (NPV) to determine the user's future value to the provider. In dependence on the NPV, minimum and maximum values for each user configurable variable related to the account and a function corresponding to the variables' interrelationship are determined. These are then used to generate the user interface Web page 150 that operates in a manner corresponding to that described with reference to Figure 1. In particular, the maximum and minimum values limit the settings of the interface controls whilst the function determines their interdependency between the controls. For example, if the cash-back control is moved to increase cash-back, the function would dictate the amount to increase the APR control by.

The user is then able to operate the controls of the user interface to select settings for each of the variables. Once the user accepts the settings, they are submitted to the server 100 by the Web page 150. The server then generates a corresponding account for the user in an account database 190 and communicates with a credit card supply system (not shown) to arrange supply of the credit card.

The user is provided with a username and password enabling him to subsequently access and amend the settings for the variables on the Web page 150 via the logon page 160.

The NPV for a credit card customer depends in part on the information obtained from the credit-check and personal and financial details. These take into account estimations of the likelihood of a customer defrauding or defaulting a payment against the provider, the likelihood of a customer transferring an existing balance, a projected monthly amount the customer will spend, the likelihood the customer's account will go dormant, the likelihood the customer will move to another provider. In addition, the NPV depends upon the user's settings for the controls described above. For each type of customer, a set of possible value combinations exist that the variables must be set at in order for the customer to have a predetermined expected profitability to the provider. In essence, this defines the interrelationship between the variables in order to maintain this desired profitability.

In order to avoid the computationally expensive and complicated process of calculating the profitability for each potential customer taking into account the user settings, a number of buckets are defined, the buckets covering between them the full range of possible customer profiles. For example, if each customer is modelled by six parameters and each of the six parameters is divided into five ranges of values for the

purpose of limiting the number of buckets, all possible customer profiles can be modelled in 15,625 buckets. Each bucket thus covers a wide range of possible customer profiles. A set of values for each bucket is pre-calculated and stored in a database 200. These values include coefficients corresponding to a formula approximating the relationship between the user settings in order to achieve a constant profitability, preferably as a linear approximation. The coefficients are stored with the data for the bucket in the database 200. Minimum and maximum values for each parameter are also stored in the database 200. These may be predefined to, for example, minimise the risk of taking on an unprofitable customer due to miss-scoring of NPV whilst ensuring no customer is charged a ridiculously high annual charge or interest rate.

Upon determining a potential customer's characteristics, the closest bucket is determined and the server 100 obtains the coefficients and minimum and maximum values for the bucket. These are passed along with a Web-based application, such as a Java applet, to the Internet terminal 170. The Internet terminal 170 runs the application using the coefficients applied to a standard interdependency formula and minimum and maximum values to generate the user interface.

For example, in the credit card example above, the standard interdependency formula may be:

$$\text{APR} = a(\text{cash-back}) + b(\text{annual fee}) + c(\text{balance transfer APR}) + \text{constant}$$
where the coefficients provided are a, b and c.

The Web-based application may be pre-configured to start the interface with parameters set at an intermediate position calculated from the Min and Max values, for example, an annual fee of £10, no cash back and an introductory interest rate of 3%. This would give the user a starting point from which he or she could adjust the parameters to suit his or her preferences.

When a user accepts the settings and establishes an account, the coefficients, maximums and minimums are stored in the database 190 with the user's account record. Should the user logon to the user interface to update the variable settings, the data is retrieved from the user's account record to drive the Web-based application discussed above.

Exact coefficients, maximums and minimums corresponding to an established customer's characteristics are likely to be determined and recorded against the user's account record. This is because there is likely to be a real return on having exact

values instead of approximations based on the closest bucket. From the exact values it may turn out that the provider is being too generous and offering the user too many benefits than his or her true characteristics deserve. Alternatively, it may be that the NPV of the user should actually provide more benefits to the user. After updating the

5 user's record with exact values, the provider can advise the user he or she should re-visit the Web site 120 to update the variable values based on his or her new evaluation.



## Claims

1. A method of offering a personalised financial product comprising the steps of:
  - (a) obtaining details from a user;
  - 5 (b) determining profitability characteristics of the user in dependence on the obtained details;
  - (c) offering a financial product to the user, the financial product having a plurality of inter-related cost-benefit parameters changeable by the user, the inter-relationship of the parameters being determined in dependence on the profitability characteristics
  - 10 of the user, wherein the parameter settings are changeable by the user, a change to one parameter setting having a corresponding effect on one or more of the other parameter settings determined by the inter-relationship;
  - (d) receiving acceptance of the financial product from the user, the acceptance including the parameter settings; and,
  - 15 (e) creating a financial product for the user, the product having characteristics determined in dependence on the parameter settings.
2. A method according to claim 1, further comprising the steps of:
  - (f) accepting updated parameter settings from the user after creation of the
  - 20 financial product; and,
  - (g) updating the financial product for the user in dependence on the updated parameter settings.
3. A method according to claim 1 or 2, in which the user details obtained in step
- 25 (a) include selected ones of: employment data, financial data, personal data, home address, and family data.
4. A method according to claim 1, 2 or 3, in which the profitability characteristics determined in step (b) include selected ones of: credit check for the
- 30 user's name, fraud check for the user's home address, background check on the user, projected likelihood of the user defrauding or defaulting a payment against the provider, projected likelihood of the user transferring an existing balance, projected monthly amount the user will spend, the projected likelihood the user's account will go dormant, projected likelihood the user will move to another provider.

5. A method according to claim 1 to 4, in which the financial product is a selected one of: credit card, loan, mortgage, investment product or insurance product.
- 5 6. A method according to any preceding claim, in which the inter-relationship of parameters is selected from one of a set of inter-relationship parameters, each set being pre-calculated for users fitting a predetermined range of details.
7. A method according to claim 6, in which the inter-relationship of parameters is  
10 updated for an existing user based on actual data from the user's usage of the financial product.
8. In a computer implemented transaction system for the offer and management of financial products, a server is arranged to offer customisable financial products to  
15 users, to determine profitability characteristics of the user in dependence on obtained user details and generate a user interface having a plurality of inter-related cost-benefit parameters changeable by the user, the inter-relationship of the parameters being determined in dependence on the profitability characteristics of the user, wherein the parameter settings are changeable by the user, a change to one parameter  
20 setting having a corresponding effect on one or more of the other parameter settings determined by the inter-relationship, the server being arranged to receive an acceptance of the financial product from the user, and initiate the creation of a financial product for the user, the product having characteristics determined in dependence on the parameter settings.
- 25 9. A computer implemented transaction system according to claim 8, in which the transaction system comprises a World Wide Web site, the server being arranged to host the Web site.
- 30 10. A computer implemented transaction system according to claim 8 or 9, in which the server is connected to a database of parameter permutations, the server being arranged to access the database and determine allowable parameter permutations according to the user's details, the allowable parameter permutations being used to generate the user interface.

11. A computer implemented transaction system according to claim 10, in which the database stores parameter permutations as coefficients to a predetermined equation, the equation defining the inter-relationship between parameters.

5

12. A computer implemented transaction system according to claim 10 or 11, in which the database stores parameter permutations for each of a predetermined set of user details, the server being configured to select the closest predetermined set corresponding to the user's details.

10

13. A computer implemented transaction system according to any of claims 10 to 12, further comprising a user interface system downloadable onto a user terminal, the user interface system being operative to accept parameter permutations from the server, to generate and display the user interface in dependence on the parameter permutations, to accept user inputs changing the parameter settings and to communicate the selected parameter settings to the server.

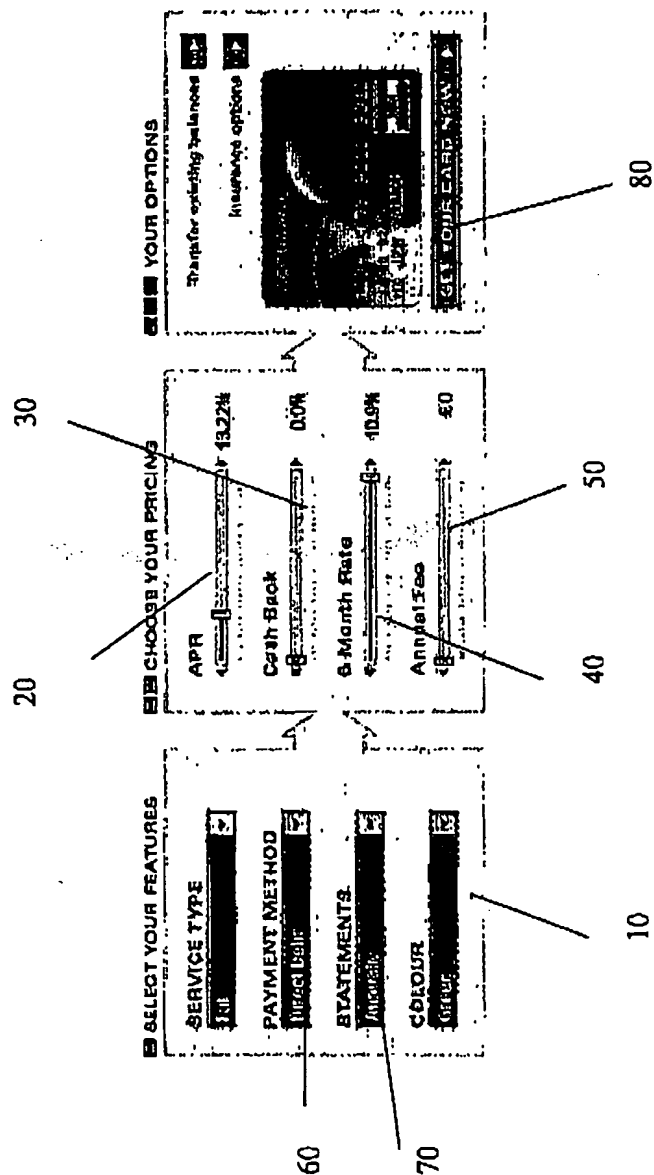
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14. A computer implemented transaction system according to any of claims 8 to 13, in which the server is arranged to communicate with databases and data services to obtain data for calculating the profitability characteristics of the user, the databases and data services including: credit clearance, background checks, demographic data, business logic, household background databases and probability based systems.

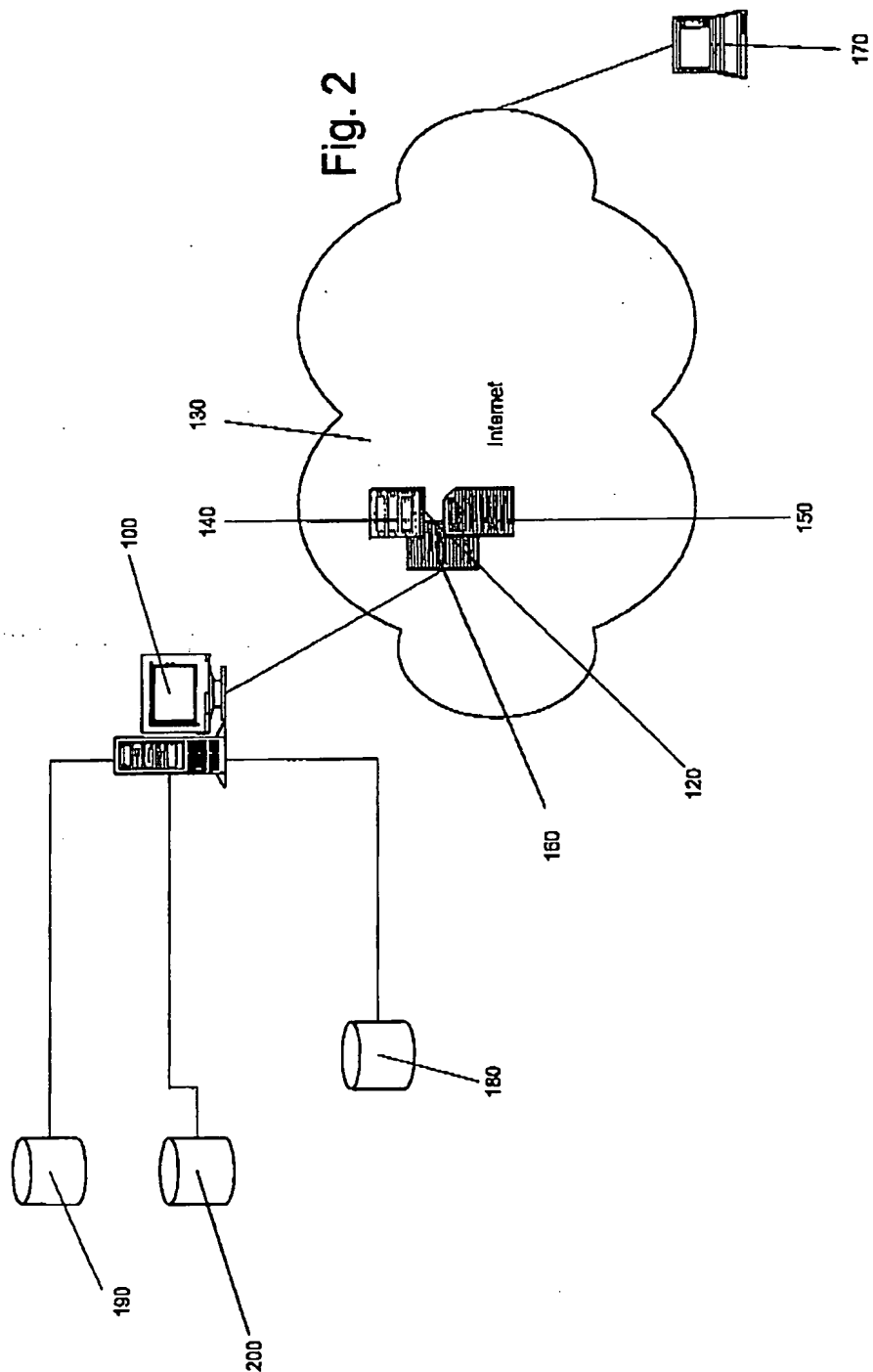
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Fig. 1



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